

**REMARKS*****Summary of the Response***

By this amendment, claims 12, 23, 25 and 26 will have been amended and new claims 29 – 31 will have been entered for consideration by the Examiner. Specifically, claim 12 has been amended into independent form and claims 23, 25 and 26 have been amended to correct a typographical error. Applicant submits that this amendment is not made in response to a prior art rejection. As such, Applicant submits that no estoppel should apply. Reconsideration of the rejected claims in view of the above amendment and the following remarks is respectfully requested.

***Summary of the Office Action***

In the instant Office Action, the Examiner has rejected claims 11 – 17, 20 – 22, 24 and 26 - 28 over the art of record and indicated claims 12, 13 and 19<sup>1</sup> as containing allowable subject matter. By the present remarks, Applicant submits that the rejections have been overcome, and respectfully requests reconsideration of the outstanding Office Action and allowance of the present application.

***Allowable Subject Matter***

Applicant appreciates the indication that claims 12, 13 and 19 are allowable. Applicant has placed claim 12 into independent form by including all of the features of the base claim and

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<sup>1</sup> Applicant notes that the Examiner has both indicated that claims 12 and 13 contain allowable subject matter and rejected claims 12 and 13 as obvious over GROVES in view of DIFFENDERFER. Thus, as addressed further below, Applicant submits that a clear record has not been presented and a clear issue has not been developed between Applicant and the Examiner.

any intervening claims. Thus, Applicant submits that claim 12, and claims 13 and 19, which depend from claim 12, are allowable.

***Traversal of Rejection Under 35 U.S.C. § 103(a)***

***1. Over Groves in view of Diffenderfer***

Applicant traverses the rejection of claims 11 – 17, 20 – 22, 24 and 26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 3,367,142 issued to Groves et al. [hereinafter GROVES] in view of U.S. Patent 4,622,022 issued to Diffenderfer et al. [hereinafter DIFFENDERFER]. The Examiner asserts that GROVES shows all the structural features of the instant invention, but for (i) the at least one rib radially projecting from one of the grooves of the hub or shaft towards one of the grooves of the other of the hub or shaft (claim 11), or (ii) the at least one rib radially projecting from one of the grooves of the outer tube or inner tube towards one of the grooves of the other of the outer tube or inner tube. The Examiner, however, asserts that DIFFENDERFER teaches (i) at least one rib radially projecting from one of the grooves of the hub or shaft towards one of the grooves of the other of the hub or shaft (claim 11) and (ii) the at least one rib radially projecting from one of the grooves of the outer tube or inner tube towards one of the grooves of the other of the outer tube or inner tube (claim 22), and that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine these references to arrive at the instant invention. Applicant respectfully disagrees.

***Independent Claims 11 and 22 over GROVES in view of DIFFENDERFER***

Independent claim 11 recites, in pertinent part:

. . . a hub having a plurality of grooves with an essentially quadrilateral groove cross section;  
a shaft having a plurality of grooves with an essentially quadrilateral groove cross section;  
at least one rib radially projecting from one of the grooves of the hub or shaft towards one of the grooves of the other of the hub or shaft.

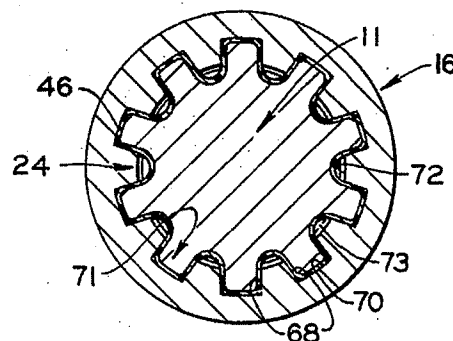
Additionally, independent claim 22 recites, in pertinent part:

... an outer tube having a plurality of grooves with an essentially quadrilateral groove cross section;  
an inner tube having a plurality of grooves with an essentially quadrilateral groove cross section;  
at least one rib radially projecting from one of the grooves of the outer tube or inner tube towards one of the grooves of the other of the outer tube or inner tube.

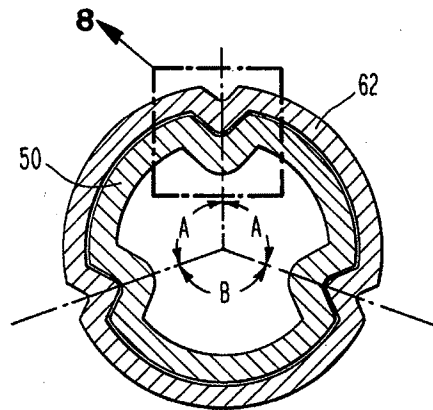
Applicant submits that these features are not shown or suggested by the applied art.

Additionally, Applicant submits that one of ordinary skill in the art would not be motivated to combine these references in the manner asserted.

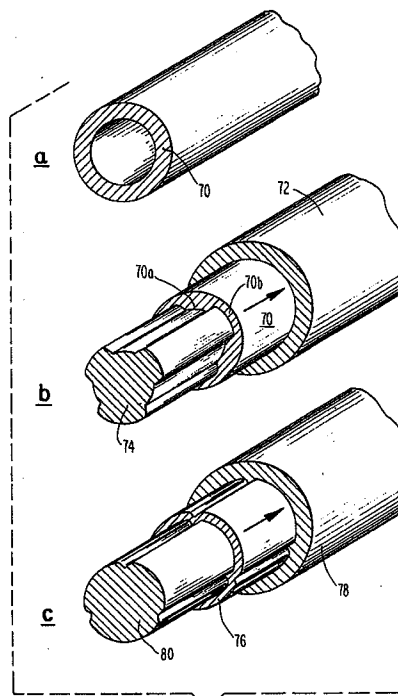
GROVES discloses a torque transmitting slip spline assembly having a hub with a plurality of grooves and a shaft with a plurality of grooves, as shown in Figure 5, reproduced below.



DIFFENDERFER discloses a telescoping tube for torque transmission having a hub with a plurality of grooves, as shown in Figure 7, reproduced below.

***Fig. 7***

In addressing claims 11 and 22, the Examiner refers to Figure 9 of DIFFENDERFER and asserts that DIFFENDERFER discloses “a shaft (74) having at least one rib (R) radially projecting from one of the groove (G) of the shaft (74) towards one of the grooves of the hub (70).” Applicant has reproduced Figure 9 of DIFFENDERFER below.

***Fig. 9***

Initially, Applicant respectfully submits that the Examiner has misinterpreted the teachings of DIFFENDERFER. As disclosed in DIFFENDERFER, Figure 9 shows successive stages in the forming of the tubes making up the telescoping torque transmitting coupling. As described at col. 9, lines 21 – 60, DIFFENDERFER initially begins the formation process with a precursor tube 70 from which a tube is formed, as shown in Figure 9a. Then through a series of intermediate stages, the precursor tube 70 is shaped by being drawn through one or more dies 72, 78 over a like number of mandrels 74, 80 as shown in Figures 9b, 9c.

With this in mind, Applicant respectfully submits that the Examiner's analysis of the teachings of DIFFENDERFER is incorrect, since DIFFENDERFER merely discloses the formation of the grooved shaft and/or hub. That is, Applicant submits that Figure 9 shows a specific step in the formation of the grooved shaft or hub, i.e., where the grooves/protrusions are formed in the tube surface. In this regard, as the protrusions, identified by the Examiner as ribs R, define the grooves, Applicant submits there is no arguable or even logical basis to assert that the protrusions defining the DIFFENDERFER's grooves are at least one rib radially projecting from one of the grooves, as recited in at least independent claims 11 and 22.

Thus, Applicant submits that DIFFENDERFER only teaches a hub (or outer tube) having a plurality of grooves and a shaft (or inner tube) having a plurality of grooves. As the grooves are defined by the protruding portions (identified by the Examiner as R), Applicant submits DIFFENDERFER does not disclose at least one rib *radially projecting from one of the grooves* of the hub or shaft towards one of the grooves of the other of the hub or shaft, as recited in at least independent claim 11, nor does DIFFENDERFER disclose at least one rib *radially projecting from one of the grooves* of the outer tube or inner tube towards one of the grooves of the other of the outer tube or inner tube, as recited in at least independent claim 22.

As neither applied document discloses or suggests at least one rib radially projecting from one of the grooves, Applicant submits no proper combination of GROVES in view of DIFFENDERFER can render obvious the invention recited in at least independent claims 11 and 22.

Moreover, assuming *arguendo* that the grooves of DIFFENDERFER could be construed as at least one rib radially projecting from one of the grooves of the hub or shaft towards one of the grooves of the other of the hub or shaft (which Applicant does not concede), Applicant submits that one of ordinary skill in the art would not be motivated to combine GROVES and DIFFENDERFER in the manner asserted.

In addressing the motivation to combine these references, the Examiner asserted that “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the profile groove of [GROVES] with a rib projecting from the shaft as taught by [DIFFENDERFER] in order for the torque transmit from the shaft to the hub.” However, as discussed above, Applicant submits “ribs R” identified by the Examiner are merely protruding portions that define the grooves (or *vice versa*), and, as shown by DIFFENDERFER, these protruding parts (e.g., on the shaft) communicate with complementary grooves (e.g., on the hub), while the grooves (e.g., on the shaft) communicate with complementary protruding parts (e.g., on the hub). Thus, the arrangement of DIFFENDERFER does not structurally add to that of GROVES, and certainly does not arguably disclose ribs radially projecting from at least one groove, as recited in the independent claims.

Further, as DIFFENDERFER does not add any structure not already described by GROVES, Applicant submits there is not arguable reason for modifying GROVES in

view of DIFFENDERFER, in the manner suggested by the Examiner. Moreover, even assuming one ordinarily skilled in the art modified GROVES in the manner asserted by the Examiner, Applicants submit the resulting combination would not arguably include the recited ribs radially projecting from at least one groove, as recited in the claims.

Additionally, Applicant submits that the Examiner's reliance on the "embodiment" of DIFFENDERFER's Figure 9 is misplaced in that this figure is an illustration of an intermediate process step in the formation of the shaft and/or hub, and does not even arguably show a coupling between a shaft and hub. Accordingly, Applicant submits that one of ordinary skill in the art would not attempt to combine the structure shown in Figure 9b of DIFFENDERFER (representing an *intermediate stage*) with the hub-shaft structure disclosed in GROVES. Thus, Applicant submits that the Examiner has not set forth a proper motivation and has not set forth a *prima facie* case of obviousness.

For at least these reasons, Applicant submits that GROVES in view of DIFFENDERFER does not render claims 11 and 22 unpatentable.

Dependent Claims 12 – 17, 20, 21, 24 and 26 over GROVES in view of DIFFENDERFER

Applicant respectfully submits that claims 12 – 17, 20, 21, 24 and 26 depend from allowable independent claims, and are allowable based upon the allowability of the independent claims, and because these claims recite additional subject matter to further define the instant invention.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 11 – 17, 20 - 22, 24 and 26 under 35 U.S.C. § 103(a) and indicate that these claims are allowable.

2. Over Groves in view of Diffenderfer and further in view of Fukukawa

Applicant traverses the rejection of claims 27 and 28 under 35 U.S.C. § 103(a) as being unpatentable over GROVES in view of DIFFENDERFER and U.S. Patent Publication 2002/0040835 issued to Fukukawa [hereinafter FUKUKAWA]. In addressing claims 27 and 28, the Examiner states “that [GROVES] disclose the claimed invention except for a method of producing a groove profile comprising conforming a surface of one of the hub and the shaft with a profile mandrel through engagement with one or more profile rollers; and profiling the surface of one of the hub and the shaft to form the at least one rib.” However, the Examiner asserts that FUKUKAWA teaches these recited features and that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the profile groove of [GROVES] with the step method of [FUKUKAWA] in order to produce a groove profile.” Applicant disagrees that one of ordinary skill in the art would be motivated to combine the applied references in the manner asserted.

Applicant submits that, like GROVES and DIFFENDERFER discussed above, FUKUKAWA fails to disclose or suggest at least one rib radially projecting from at least one groove, as recited in at least independent claims 11 and 22.

As none of the applied documents of record arguably disclose or suggest at least one rib radially projecting from one of the grooves, Applicant submits no proper combination of GROVES in view of DIFFENDERFER and further in view of FUKUKAWA can render obvious the invention recited in at least independent claims 11 and 22.



Moreover, Applicant respectfully submits that claims 27 and 28 are allowable for the reason that each of these claims depends from an allowable independent claim, and because each of these claims recite additional subject matter to further define the instant invention.

Additionally, Applicant submits that one of ordinary skill in the art would not be motivated to combine the applied references in the manner asserted. Claim 27 recites, in pertinent part:

. . . conforming a surface of one of the hub and the shaft with a profile mandrel through engagement with one or more profile rollers; and  
profiling the surface of one of the hub and the shaft to form the at least one rib.

Claim 28 recites, in pertinent part:

. . . periodic impacting engaging of the one or more profile rollers with a surface of one of the hub and the shaft.

Initially, Applicant submits that claims 27 and 28 are rejected over GROVES in view of DIFFENDERFER and FUKUKAWA. That is, claims 27 and 28 depend from claim 11, which was rejected over GROVES in view of DIFFENDERFER. However, in treating claims 27 and 28, the Examiner seems to impermissibly reject these claims over GROVES in view of FUKUKAWA. That is, the Examiner asserts that it would have been obvious to one of ordinary skill in the art to use the method of manufacture disclosed in FUKUKAWA to form the structure disclosed in GROVES. However, Applicant submits that the proper obviousness analysis must relate to the structure that is purported to be disclosed by GROVES in view of DIFFENDERFER.

Applicant notes that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore &*

*Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Further, Applicant notes that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. Additionally, Applicant notes that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Applicant submits that modifying GROVES in view of DIFFENDERFER with the process of FUKUKAWA in the manner asserted by the Examiner would change the principle of operation of the prior art invention. That is, DIFFENDERFER discloses a method of manufacture, as discussed above and shown in Figure 9. Specifically, the DIFFENDERFER process uses dies and mandrels without engagement with profile rollers. As such, modifying GROVES in view of DIFFENDERFER with the process of FUKUKAWA, which uses engagement with one or more profile rollers, as asserted by the Examiner would change the principle of operation of the DIFFENDERFER method of manufacture.

Thus, Applicant respectfully submits that DIFFENDERFER teaches away from being modified in the manner asserted by the Examiner, in that the modification of DIFFENDERFER in the manner asserted by the Examiner would change the principle of operation of DIFFENDERFER manufacturing process. As such, Applicant submits that it would not have been obvious to one of ordinary skill in the art to modify GROVES in view of DIFFENDERFER with the process of FUKUKAWA in the manner asserted to arrive at the claimed invention. As

such, Applicant respectfully submits that the Examiner has not set forth a *prima facie* case of obviousness.

Additionally, Applicant submits that modifying GROVES in view of DIFFENDERFER with the process of FUKUKAWA in the manner asserted by the Examiner would change the principle of operation of the of the FUKUKAWA apparatus. Applicant submits that FUKUKAWA is directed to a method and apparatus for manufacturing a cylindrical member having splines, and more specifically, is directed to manufacturing a front cover of a torque converter. As disclosed in FUKUKAWA, the process begins with a disc-shaped blank held between a tailstock and a mandrel, wherein the outer edges of the disc-shaped blank are bent downwards, thus forming a front cover of the torque converter. Inner splines are then formed in the outer edges which have been bent downwards using a flow forming process.

Thus, Applicant submits that the FUKUKAWA device requires the disc-shaped blank to be held between a tailstock and a mandrel. However, Applicant submits that neither the GROVES device nor the DIFFENDERFER device could be formed in the FUKUKAWA apparatus. That is, Applicant submits that neither the GROVES device nor the DIFFENDERFER device begins with a disc-shaped blank that could be held in the manner taught by FUKUKAWA.

Rather, GROVES discloses that a forged blank of steel is machined to create the splined shaft 11. As shown in Figures 2 and 3 of GROVES, the splined shaft is a solid piece of steel that could not be accommodated in the FUKUKAWA device, which is designed to hold a disc-shaped blank. Additionally, the sleeve 16 of GROVES, manufacturing through a hobbing (or die cutting) process, could not be accommodated in the FUKUKAWA device, which is designed to

hold a disc-shaped blank. Furthermore, as discussed above, DIFFENDERFER uses a precursor tube.

Thus, Applicant respectfully submits that FUKUKAWA teaches away from being modified in the manner asserted by the Examiner, in that the modification of FUKUKAWA in the manner asserted by the Examiner would change the principle of operation of FUKUKAWA manufacturing process. Additionally, Applicant submits that the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose. That is, the FUKUKAWA device would need to be modified in order to accommodate the starting materials of either GROVES or DIFFENDERFER, such that the modification would change the principle of operation of FUKUKAWA manufacturing process. Further, modifying FUKUKAWA to accommodate the starting materials of either GROVES or DIFFENDERFER, would render FUKUKAWA unsatisfactory for its intended purpose. As such, Applicant submits that it would not have been obvious to one of ordinary skill in the art to modify GROVES in view of DIFFENDERFER with the process of FUKUKAWA in the manner asserted to arrive at the claimed invention. Thus, Applicant respectfully submits there is no suggestion or motivation to make the proposed modification, and the Examiner has not set forth a *prima facie* case of obviousness.

Thus, for at least these reasons, Applicant submits that GROVES in view of DIFFENDERFER and FUKUKAWA does not render claims 27 and 28 unpatentable.

### ***New Claims***

Applicant has presented new claims 29 – 31 for the Examiner's consideration. Applicant submits that claims 29 – 31 recite additional features not disclosed or taught by GROVES, DIFFENDERFER or FUKUKAWA.

Applicant notes independent claim 30 is allowable at least for the reasoning set forth above with regard to the applied art of record. In particular, Applicant notes independent claim 30 recites, *inter alia*, at least one *rib radially projecting from one of the grooves* of the hub or shaft towards one of the grooves of the other of the hub or shaft, wherein the at least one rib is *formed in one piece from a material of the groove from which the at least one rib projects*, which is neither anticipated by any applied document of record considered singly nor rendered unpatentable by any proper combination of the applied documents for the reasons set forth above.

Additionally, Applicant submits that claims 29 and 31 are dependent claims, depending from distinguishable base claims. Accordingly, these claims should also be in condition for allowance based upon their dependencies.

As such, Applicant respectfully request the Examiner indicate that claims 29 – 31 are in condition for allowance.

***Complete Action Not Provided***

Applicant respectfully submits that the Examiner did not provide a complete action, and as such, Applicant submits that the next action should not be a final action. The Examiner is reminded of the guidance provided by 37 C.F.R. § 1.104(a)(1) regarding the Nature of Examination (emphasis added):

On taking up an application for examination . . . the examiner shall make a thorough study thereof and shall make a thorough investigation of the

available prior art relating to the subject matter of the claimed invention. The examination shall be complete with respect to both compliance of the application . . . with the applicable statutes and rules and to the patentability of the invention as claimed, as well as with respect to matters of form, unless otherwise indicated.

Applicant submits that all of the claims were not treated. More specifically, Applicant submits that, while claims 18, 19, 23 and 25 are listed on the Office Action Summary as rejected, these claims were not addressed in the body of the rejection. As such, Applicant submits that the Examiner has not provided a complete action. Accordingly, Applicant submits that the next action, which should clarify the status of claims 18, 19, 23 and 25 cannot be a final action.

Additionally, Applicant respectfully submits that the Examiner did not provide clear explanations of all actions taken by the Examiner. Specifically, as noted above, the Examiner indicated that claims 12, 13 and 19 contained allowable subject matter and would be allowable if placed into independent form, while at the same time rejecting claim 12 and 13 over GROVES in view of DIFFENDERFER. Moreover, in the reasons for the indication of allowable subject matter, the Examiner refers to claims 12 and 23. Therefore, Applicant submits that it is not clear which claims the Examiner has indicated as containing allowable subject matter. Thus, Applicant submits that a clear record was not provided and a clear issue was not developed between Applicant and the Examiner.

More specifically, MPEP §706 states:

Before final rejection is in order a clear issue should be developed between the examiner and applicant. To bring the prosecution to as speedy conclusion as possible and at the same time to deal justly by both the applicant and the public, the invention as disclosed and claimed should be thoroughly searched in the first action and the references fully applied; and in reply to this action the applicant should amend with a view to avoiding all the grounds of rejection and objection.

Additionally, MPEP 706.07(a) notes:

Under present practice, second or any subsequent actions on the merits shall be final, except where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p). ...

Furthermore, a second or any subsequent action on the merits in any application ... will not be made final if it includes a rejection, on newly cited art, other than information submitted in an information disclosure statement filed under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17 (p), of any claim not amended by applicant or patent owner in spite of the fact that other claims may have been amended to require newly cited art.

Accordingly, Applicant respectfully requests that the Examiner clarify the indication of allowable subject matter of claim 12, 13 and 19 and address the untreated claims, such that a clear issue is developed between the Examiner and Applicant. Moreover, Applicant submits that the next action, which should clarify the record, cannot be a final action.

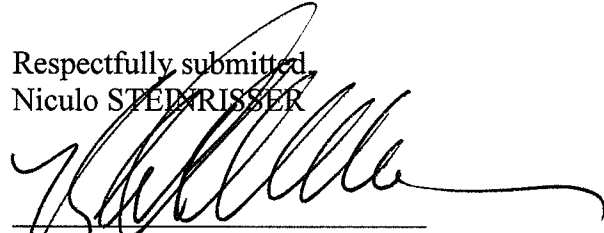
### **CONCLUSION**

In view of the foregoing, it is submitted that none of the references of record, either taken alone or in any proper combination thereof, anticipate or render obvious the Applicant's invention, as recited in claims 11 - 31. The applied references of record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

Accordingly, reconsideration of the outstanding Office Action and allowance of the present application and all of the claims therein are respectfully requested and now believed to be appropriate.

Should there be any questions, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,  
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